

**Group Assignment Question and Guidance**

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**Overview**

This assignment is designed to simulate the development of a data product that provides business insights for a selected company. You will engage in end-to-end data management, including database design, data implementation, synthetic data generation, and report creation. The project will involve the use of SQLite for database management, SQL for querying, and data visualization techniques for reporting.

**Part 1: Business Context and Database Design (25%)**

*Task 1.1: Business Context Definition*

Select a real or hypothetical company (it can be a startup). Identify key business functions and processes to understand data needs. Identify the database mini world and define the data product's purpose and expected reports that will be generated from the database.

*Task 1.2: Database Design*

Collaborate with your team to design the database. Construct an Entity-Relationship (ER) Diagram that represents the data model. Clearly document the schema design, including entities, attributes, relationships, primary keys, and foreign keys. State any assumptions that you have about the schema and identify the cardinality of the relationships in the database using relationship sets.

**Part 2: Data Implementation and Synthetic Data Generation (35%)**

*Task 2.1: SQL Schema Implementation*

Define appropriate data types for each entity. Use only SQLite datatypes and explain your decisions for the data type selection. Implement the relational database schema in SQLite using SQL Data Definition Language (DDL). Ensure all constraints, keys, and relationships are well-defined and normalized and referential integrity is enforced. Discuss alternative designs and modifications on the E-R diagram if needed.

### *Task 2.2: Synthetic Data Generation*

Generate synthetic data that reflects realistic business operations. You may want to use generative AI to make sure that you get enough records or other appropriate python packages. Ensure variety and consistency across datasets. Populate the database with at least 500 records per focus entity.

### **Part 3: Business Insights and Report Generation (30%)**

#### *Task 3.1: Business Reports Using SQL*

Develop SQL queries to generate business insights reports. Reports should align with the initial business purpose and objectives. Ensure reports extract meaningful insights from the dataset.

#### *Task 3.2: Final Report and Presentation*

Summarize the project in a structured report. Include data visualizations and key insights. Prepare a video presentation (maximum 10 minutes) explaining the database design, insights, and challenges faced.

### **Submission Guidelines**

- Submit a 2000-word report detailing your approach. You may want to include diagrams and code fragments as you wish. Extended code should be provided in the appendix.
- Submit an MP4 video presentation (max 10 minutes) explaining your findings.

### **Evaluation Criteria**

- Database Design and Implementation: 25%
- Implementation and Synthetic Data Quality: 35%
- Business Reports: 30%
- Presentation and Documentation: 10%

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**Presentation Time:**      **Maximum 10 minutes per group (*this is a strict limit, not a guideline*); presentations should be recorded for submission**

**Submission Format:**      Submit an MP4 video presentation (max 10 minutes) explaining your findings.

**One member of each group should make the submission on behalf of the whole group.**

**Assessment Weighting:** 40%

**Submission Deadline:**      **Thursday 20<sup>th</sup> March 2025 before 12:00:00 (UK time)**

**Marks Released by:**      **Thursday 17<sup>th</sup> April 2025**  
*(we will aim to release marks by this date, but in the event of an unavoidable delay a message will be posted on the module page)*

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### **Use of Artificial Intelligence**

**The University recognises an increasing number of technologies such as Artificial Intelligence and that they may be applicable in your completing this assessment. The assessment brief sets out specific requirements or restrictions, and your student handbook has further guidance and advice.**

You are reminded that the inappropriate use of such a technology may constitute a breach of University policy, such as the Proofreading Policy or [Regulation 11 \(Academic Integrity\)](#). If you breach these policies, it may have significant consequences for your studies. Please make sure you read and understand the assessment brief and how AI may or may not be used.

**Failure to disclose the use of any AI at the point of submission may be prejudicial in any later investigations, should they arise.**

For this assessment, AI is:

#### **PERMITTED (neither prohibited or required)**

If you use a generative Artificial Intelligence (AI) in the process of completing this assessment you **MUST** set out clearly the following:

- WHY you used a generative AI
- WHAT it was used for
- WHICH AI was used; and
- If any generated content has been used directly in this submission, if so where.

Note that this declaration does NOT contribute towards the word count for the assessment.

You will also have to confirm in your declaration that the work remains yours and you have intellectual ownership of it. You may be called for viva or other interview to demonstrate such intellectual ownership. A failure to disclose the use of AI, or the use of a misleading description of its use may have significant consequences for your studies. As a result, keeping good records of your interactions is strongly advised.

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### **Submitting your work**

**Before you submit your assessment, you should ensure you are familiar with the guidance and rules in the “Your Assessments” section of your [Student Handbook](#), paying particular attention to:**

- [Assignment Preparation](#)
- [Academic Integrity \(including Plagiarism\)](#)
- [Referencing](#)

- [Word Count Policy and Formatting](#)
  - [Confidentiality of your work](#)
  - [Deadlines and Extensions](#)
  - [Late submission of work](#)
  - [Guidelines for Online Submission](#)
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### **Mitigating Circumstances**

Mitigating circumstances MUST be submitted **within 20 working days following the submission deadline**. Mitigating circumstances not submitted by the relevant deadline are not required to be considered by the School/Department and may have to be considered by an Academic Appeals Committee as part of an academic appeal – for further information, please see: <https://warwick.ac.uk/services/gov/calendar/section2/regulations/reg42academicappeals>

Please see your Student Handbook for more guidance on mitigating circumstances

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